REMARKS

This Amendment is filed in response to the Final Office Action mailed Oct. 19, 2009 in connection with a Request for Continued Examination. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

Claims 1-28 are now pending in the application.

Claims 1, 14, 22 and 23 have been amended.

New claims 24-28 have been added

Claim Rejections - 35 U.S.C. §103

At paragraphs 2-4 of the Final Office Action, claims 1, 4, 14, 15, 19, 22 and 23 were rejected under 35 U.S.C. §103(a) over IEEE Standards for Local and Metropolitan Area Networks: Virtual Bridge Local Area Networks, IEEE Std. 802.1Q, 1998 (hereinafter "802.1Q") in view of IEEE Standard Part 3: Media Access Control (MAC) Bridges, IEEE Std. 801.1D, 1998 (hereinafter "802.1D"), in further view of Collette et al., U.S. Publication No. 2003/0177243 (hereinafter "Collette").

The Applicant's claim 1, representative in part of the other rejected claims, sets forth (emphasis added):

> 1. An intermediate network device having a plurality of ports for sending and receiving network messages to and from one or more entities of a computer network at least some of which are segregated into a plurality of virtual local area network (VLANs) defined within the computer network, the intermediate network device comprising:
>
> a compact-Generic Application Registration Protocol (GARP) VLAN Registration Protocol (GVRP) application component associated with a selected port, the compact-GVRP application component having:
>
> a GARP Information Declaration (GID) component configured to maintain VLAN registration state for the selected port in response to receiving attribute events for the VLANs;
>
> a compact-GVRP encoder/decoder unit; and
>
> a GVRP protocol data unit (PDU) message generator, wherein

> the compact-GVRP encoder/decoder unit is configured to ***compute encoded values, in accordance with an encoding algorithm that encodes a plurality of attribute events that are each associated with a different VLAN of a given set of VLANs into each encoded value***, and
>
> the GVRP PDU message generator ***loads the encoded values computed for all of the VLANs defined within the computer network within a single GVRP PDU message*** for transmission from the selected port.

802.1Q describes a conventional form of GVRP where "GVRP allows both end stations and Bridges in a Bridged LAN to issue and revoke declarations relating to memberships of VLANs." *See* 802.1Q, Section 11.2.1. In order to exchange VLAN membership information, bridges and end station exchange GVRP PDU messages. In conventional GVRP PDU messages, a multiple-byte attribute structure is provided for each active VLAN to express the state that VLAN. **Specifically, for each active VLAN a separate multiple-byte attribute structure including a two octet (i.e., two byte) "Attribute Value" field is used**. *See* 802.1Q, Section 11.2.3.1.3.

802.1D discusses the conventional format of a GARP Protocol Data Unit (PDU). At Section 12.11.1.2, 802.1D states that a conventional GARP PDU includes "[a]n Attribute List consists of one or more *Attributes*…." *See also* 802.1D Fig. 12-6. 802.1D goes on to discuss that "[s]uccessive messages are packed into the GARP PDU, and within each Message, successive Attributes are packed into each Message, until the end of the PDU is encountered or there is no more attributes to pack at that time." *See* 802.1D Section 12.11.3.1. "**The PDU has exactly enough room for the first N Attributes that require to be transmitted at the time to be packed. In this case, the PDU is transmitted, and the next N Attributes are encoded in a subsequent PDU**." *See* 802.1D Section 12.11.3.1.

Collette discusses a technique for "batching multiple [Fiber Channel] frames together, compressing the batched frames, and forming a single datagram … from the compressed frames." *See* Collette paragraphs 0012 and 0027. A "compression header 32" is

appended to the compressed frames, where "[t]he compression header 32 contains information about the compression…." *See* Collette paragraph 0035 and Fig. 5.

I. Overview of Problems in the Art and Claimed Subject Matter

While conventional GVRP PDU messages that use separate multiple-byte attribute structures for each active VLAN work well in smaller networks, which only have a couple hundred active VLANs, they do not scale well to larger networks. For instance, a L2 Metropolitan Area Network (MAN) may utilize thousands of different VLANs, or conceivably could use all 4094 defined VLANs. As a GVRP PDU message is typically limited to 1500 bytes in size, due to message size limits, using separate multiple-byte attribute structures for each VLAN presents a significant problem. Namely, if multiple bytes are required to represent the state of each VLAN, and there are thousands of VLANs used in the network, but GVRP PDU messages are limited to 1500 bytes, multiple GVRP message are required to express the state of all the VLANs. As the Applicant discusses in the background section of the Application, in a worst-case scenario, a bridge may need to exchange 11 or more conventional GVRP PDUs messages to convey membership information for all VLANs, consuming excessive network bandwidth and causing congestion.

The Applicant overcomes this shortcoming, and other shortcomings, by teaching a technique that can store membership information for all VLANs defined in a network in a single GVRP PDU message. As part of such technique, the Applicant "***compute[s] encoded values, in accordance with an encoding algorithm that <u>encodes a plurality of attribute events that are each associated with a different VLAN of a given set of VLANs into each encoded value.</u>***" *See e.g.*, claim 1. This enables the Applicant to "***load[] the encoded values computed for <u>all</u> of the VLANs defined within the computer network within a <u>single</u> GVRP PDU message.***" *See e.g.*, claim 1. For example, encoded values computed for "***more than 373 different VLANs***" may be loaded within a single GVRP PDU message." *See e.g.*, claim 27.

II. None of the References Suggest Loading Encoded Values for <u>All</u> of the VLANs Defined Within the Computer Network Within a <u>Single</u> GVRP PDU Message

While the Applicant "***loads the encoded values computed for <u>all</u> of the VLANs defined within the computer network within a <u>single</u> GVRP PDU message***", for example, loads values computed for more than 373 VLANs within the single GVRP PDU message, 802.1Q and 802.1D describe conventional GVRP PDU messages that are typically incapable of storing membership information for large numbers of VLANs in a single GVRP PDU message, and require multiple GVRP PDU messages to convey membership information for the VLANs. Further Collette is silent regarding such limitation.

802.1Q teaches that a separate multiple-byte attribute structure should be used for each active VLAN to express the state that VLAN, wherein each multiple-byte attribute structure including, among other things, a two octet (i.e., two byte) "Attribute Value" field. *See* 802.1Q, Section 11.2.3.1.3. Use of a multiple-byte attribute structure for each VLAN typically precludes the storage of attributes for all of the VLANs defined within a computer network, for example, for more than 373 VLANs, within a single GVRP PDU message. There is simply not enough room. Indeed, there appears to be at least partial agreement that 802.1Q does not teach this aspect of the claims, as the Examiner comments at page 4 of the Final Office Action that "802.1Q does not disclose … the GVRP PDU message generator loads the encoded values computed for all of the VLANs defined within the computer network into a single GVRP PDU message…."

Combination with 802.1D does not remedy the deficiencies of 802.1Q. Rather than suggest that values for <u>all</u> of the VLANs defined within the computer network are loaded into a <u>single</u> GVRP PDU message, 802.1D teaches that <u>multiple</u> GARP PDU messages are generally needed to disseminate VLAN registration information. 802.1D explicitly states that "[t]he PDU has exactly enough room for the first N Attributes that require to be transmitted at the time to be packed. In this case, the PDU is transmitted, and **the next N Attributes are encoded in a subsequent PDU**." *See* 802.1D section

12.11.3.1 (emphasis added). Thus, rather then suggest using a single message, 802.1D envisions that multiple ones will generally be required. At page 4 of the Final Office Action, the Examiner cites to Fig. 12-6 of 802.1D. While Fig. 12-6 depicts several Attributes being placed in a PDU, Fig. 12-6 does not suggests that <u>all</u> of the VLANs defined within the computer network can be placed in the PDU. For example, Fig. 12-6 does not suggest that attributes for more than 373 VLANs can all be placed in the PDU. *See e.g.*, claim 27. As explained at section 12.11.3.1 of 802.1D, multiple (i.e. a first and subsequent) PDU's would be needed in such a situation according to 802.1D.

Finally, Collette does not suggest "***load[ing] the encoded values computed for <u>all</u> of the VLANs defined within the computer network within a <u>single</u> GVRP PDU message.***" Collette simply discusses "batching multiple [Fiber Channel] frames together, compressing the batched frames, and forming a single datagram" from them. No mention is even made of VLANs or GVRP PDU messages.

Accordingly, the Applicant respectfully urges that a combination of 802.1Q, 802.1D and Collette is legally insufficient to make obvious the present claims under 35 U.S.C. §103(a) at least due to the claimed "***loads the encoded values computed for <u>all</u> of the VLANs defined within the computer network within a <u>single</u> GVRP PDU message***."

III. None of the References Suggest Computing Encoded Values by Encoding a Plurality of Attribute Events that are Each Associated with a Different VLAN of a Given Set of VLANs into Each Encoded Value

While the Applicant "***compute[s] encoded values, in accordance with an encoding algorithm that <u>encodes a plurality of attribute events that are each associated with a different VLAN of a given set of VLANs into each encoded value</u>,***" 802.1Q and 802.1D describe conventional GVRP PDU messages that store individual attributes separately, and Collette merely describes compressing a batch of Fiber Channel frames. None of the references take several attribute events that are each for different VLANs and then produce a single value from them.

More specifically, instead of representing attribute events for a set of several VLANs by a single encoded value, 802.1Q directs that separate multiple-byte attribute structures are needed for each VLAN. *See* 802.1Q, Section 11.2.3.1.3.

Combination with 802.1D does not remedy the deficiencies of 802.1Q. Similar to 802.1Q, instead of representing attribute events for a set of several VLANs by a single encoded value, 802.1D directs that each VLAN should have its own attribute and "successive attributes are packed into each Message, until the end of the PDU is encountered or there are no more attributes to pack." *See* 802.1D section 12.11.3.1.

Further combination with Collette does not remedy the deficiencies of 802.1Q and 802.1D. Collette does not suggest computing "***encoded values, in accordance with an encoding algorithm that encodes a plurality of attribute events that are each associated with a different VLAN of a given set of VLANs into each encoded value***." Collette merely batches multiple Fiber Channel frames together, compresses the batched frames, and forms a datagram from them. *See* Collette paragraphs 0012, 0035 and Fig. 5. Applying compression to a group Fiber Channel frames is quite different than encoding together attribute events associated with VLANs. A frame is typically understood to be a unit of data complete with addressing and necessary protocol control information. In contrast, an attribute event is typically just one or more values in field(s) within a PDU. Compressing together several frames does not suggest encoding together different attribute events.

Accordingly, the Applicant respectfully urges that a combination of 802.1Q, 802.1D and Collette is legally insufficient to make obvious the present claims under 35 U.S.C. §103(a) at least due to the claimed computing "***encoded values, in accordance with an encoding algorithm that <u>encodes a plurality of attribute events that are each associated with a different VLAN of a given set of VLANs into each encoded value</u>.***"

At paragraph 5 of the Final Office Action, claims 2 and 3 were rejected under 35 U.S.C. §103(a) over 802.1Q in view of 802.1D, in further view of Collette, in still further view of Huang, U.S. Patent No. 4,281,391 (hereinafter "Huang").

At paragraph 6 of the Final Office Action, claim 5 was rejected under 35 U.S.C. §103(a) over 802.1Q in view of 802.1D, in further view of Collette, in still further view of Churchyard et al., U.S. Patent No. 7,089,302 (hereinafter "Churchyard").

At paragraph 7 of the Final Office Action, claims 6-8 and 10 were rejected under 35 U.S.C. §103(a) over 802.1Q in view of 802.1D, in further view of Collette, in further view of Churchyard, in still further view of Rodeheffer et al., U.S. Publication No. 2005/0036500 (hereinafter "Rodeheffer").

At paragraph 8 of the Final Office Action, claims 9 and 18 were rejected under 35 U.S.C. §103(a) over 802.1Q in view of 802.1D, in further view of Collette, in further view of Churchyard, in still further view of Rodeheffer, in still further view of Liu et al., U.S. Publication No. 2004/0061773 (hereinafter "Liu") and Uchida et al., U.S. Publication No. 2004/0076130 (hereinafter "Uchida").

At paragraph 9 of the Final Office Action, claims 11 and 12 were rejected under 35 U.S.C. §103(a) over 802.1Q in view of 802.1D, in further view of Collette, in further view of Churchyard, in still further view of Rodeheffer, in still further view of Liu.

At paragraph 10 of the Final Office Action, claim 13 was rejected under 35 U.S.C. §103(a) over 802.1Q in view of 802.1D, in further view of Collette, in still further view of Davis et al, U.S. Publication Number 2003/0043806 (hereinafter "Davis") and "Gharachorloo et al., U.S. Publication Number 2002/0087806 (hereinafter "Gharachorloo").

At paragraph 11 of the Final Office Action, claims 16 and 17 were rejected under 35 U.S.C. §103(a) over 802.1Q in view of 802.1D, in further view of Collette, in still further view of Churchyard and Rodeheffer.

At paragraph 12 of the Final Office Action, claims 20 and 21 were rejected under 35 U.S.C. §103(a) over 802.1Q in view of 802.1D, in further view of Collette, in still further view of Churchyard and Rodeheffer.

The Applicant notes that claims 2, 3, 5-13, 16-18, 20 and 21 are dependent claims that depend from independent claims believed to be allowable for at least the reasons discussed above. Claims 2, 3, 5-13, 16-18, 20 and 21 are believed to be allowable due to their dependency, as well as for other separate reasons.

In the event that the Examiner deems personal contact desirable in disposition of this case, the Examiner is encouraged to call the undersigned attorney at (617) 951-2500.

In summary, all the independent claims are believed to be in condition for allowance and therefore all dependent claims that depend there from are believed to be in condition for allowance. The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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